



THE NAUTILUS

Vol. XLIX.

July, 1935

No. 1

A RECENT INTRODUCTION OF EXOTIC SPECIES OF MOLLUSCS INTO CALIFORNIA WATERS FROM JAPAN

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During the last few years, interest in the culture of oysters in California waters has brought about the introduction of seed oysters (*Ostrea gigas*) from Japan. The California oyster business has been confined for many years to San Francisco and Tomales Bays which were used as holding grounds for the eastern oyster (*O. virginica*). Several pests were brought in and planted with them. None of the other bays in California were used, and as a result are free from undesirable species. The importing of Japanese "seed" therefore constitutes a new business, and as these seed are being planted in clean bays and inlets it was deemed advisable to inspect all incoming seed and to exclude if possible all the species of animals which might be harmful to the oysters as well as to the native fauna. The inspection has been carried on by H. C. McMillin and the writer and has already resulted in benefit to the growing oyster business. The first shipments were heavily infested with various species of molluscs but did not carry the dreaded Japanese drill (*Tritonalia japonica*). Finally on March 7, 1930, a shipment was received which was well stocked with drills and their egg cases. This shipment was condemned and piled up to dry on the beach. Since that time the Japanese producers have been much more particular with their seed, and it is unusual to find anything deleterious in the present shipments.

On March 26, 1930, a shipment of 150 boxes of Japanese seed was sampled at Elkhorn Slough, California. Twenty boxes of seed were washed and the resulting residue carefully examined. The specimens obtained were sent for identification to the United

States National Museum where the molluscs were identified by Dr. Paul Bartsch and the crustacea by Dr. H. A. Pilsbry. There were 22 species of molluscs and one crustacean. As far as we know no drills have been planted, but of course there is always the chance that they may have eluded us. However none have yet been found on the new beds.

Japanese species introduced with seed oysters. 3/26/30.

Thais tumulosa clavigera (Küst)
Alectrion lirata (Dkr.) (?*A. festiva* Powis)
Turbo coronatus (Gmel.)
Tegula undatella (Gould) young
Potamides (Batillaria) multiformis (Lischke)
Littorina (Littorivaga) sitchana (Phil.)
Cellana amussitata (Rve.) young
C. toreuma (Rve.) young
Acmaea concinna (Lischke)
A. heroldi (Dkr.)
A. heroldi pygmaea (Dkr.)
Siphonaria cochleariformis (Rve.)
Odostomia (Evalea) species undet.
Septifer rostratus (Dkr.) young
Modiolus atratus (Lischke)
Mytilus dunkeri (Rve.) young
Anomia laqueata (Rve.)
Pecten (Chlamys) irregularis (Sby.) young
Cypricardia lyrata (Rve.)
Paphia (Ruditapes) japonica (Desh.) young
Sunetta excavata (Hanley)
Macoma inquinata (Desh.)
Balanus amphitrite albicostatus (Pilsbry)

**SPIRALLY RIDGED EGGSHELL OF PLEURODONTE,
 WITH NOTES ON THE RAPID GROWTH
 OF A LAND SNAIL**

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While eggs of snails may be very small the egg capsule or eggshell may be very large as it encloses both the egg and much food material to feed the young before it comes out of the shell. Such eggshells may look like those of reptiles or of birds, and as far as we know they are smooth on the outside. Hence the occur-